UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

Project	Date	Author
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SUBJECT—

TITLE

WESTERN PINE BEETLE INFESTATION
WITHIN THE PONDEROSA PINE STANDS OF THE
THOMPSON RIVER DRAINAGE, MONTANA
1940

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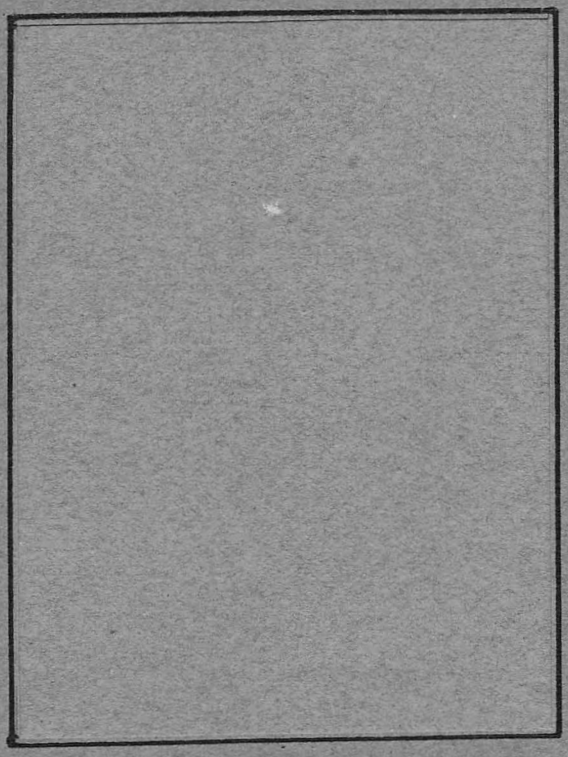

Forest Insect Laboratory
Coeur d'Alene, Idaho
November 19, 1940

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Ponderosa pine killed by Western Pine Beetle
(Dendroctonus brevicomis Lec.)

WESTERN PINE BEETLE INFESTATION WITHIN THE PONDEROSA PINE STANDS OF THE THOMPSON RIVER DRAINAGE, MONTANA 1940

In 1935, the Bureau of Entomology and Plant Quarantine conducted a bark beetle survey of the valuable ponderosa pine stands of the Thompson River drainage in Montana to determine the existing status of what had been a rather serious infestation of the western pine beetle (Dendroctonus brevicomis Lec.). This project was instituted at the request of land-managing agencies concerned, which involved the State of Montana, Northern Pacific Land Company, and the Lumber Department of the Anaconda Copper Mining Company, who contributed to the cost of the operation. Data obtained from this project showed that the outbreak of the western pine beetle that through its destructiveness had prompted the request for this service, had reached its peak in 1933 and 1934, and that there had been a marked reduction in the severity of the infestation in 1935. Although at that time no control measures were considered necessary, it was realized that a recurrence of the outbreak, which during a few years had destroyed more than 90 million board feet of valuable ponderosa pine, could be expected whenever environmental conditions favorable to the rapid development of the insects prevailed.

Periodic examinations were planned for this area, which would be followed by more intensive surveys when conditions warranted such action. Data obtained from these examinations and subsequent surveys which must be made at frequent intervals are the initial steps to be taken in preventing the development of epidemics which not only destroy large volumes of valuable timber but for which control measures are expensive and difficult. An early detection of potentially destructive bark

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MANAGEMENT

UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
WASHINGTON, D. C.

Forest Insect Laboratory
Coeur d'Alene, Idaho
November 28, 1940

Regional Forester

Missoula, Montana

Attention of Mr. Koch

Dear Sir:

I am enclosing a copy of a brief report covering a rather extensive survey of the ponderosa pine stands within the Thompson River drainage of Montana.

You will note that there are no serious infestations in any of the units covered, and it would seem that the low infestation which existed in 1935 has prevailed during this five-year period, as there is no evidence of recent losses. However, a five-year period between surveys would be a dangerous procedure to follow with these old stands.

We would be pleased to have your comments and suggestions concerning this report.

Very truly yours,

JAMES C. EVENDEN
Senior Entomologist

Enclosure

cc to Forest Supervisor, Cabinet N. F.

beetle epidemics will permit the institution of artificial control measures at a time when the outbreak is on an upgrade, will reduce the number of infested trees to be treated, lessen the expense of control, and add to the effectiveness of the operation. This information also permits logging operations to be directed into stands that are susceptible to bark beetle attack for the purpose of cutting ahead of the insects.

An examination of the Thompson River drainage and adjacent ponderosa pine areas was made in October 1940 by a forest insect survey crew in charge of Mr. Terrell of the Forest Insect Laboratory, Coeur-d'Alene, Idaho. This examination was, of a necessity, quite extensive in character, and although all portions of the area were included, the sample strips covered only a small percent of the total area. However, it is believed that the data obtained, which are given in the following table, depict the present status of the infestation with an acceptable degree of error.

Status Western Pine Beetle Infestation, Ponderosa Pine Stands, Thompson River Drainage

Unit	Acres	Infested trees per acre: 1st gen.	2nd gen.	Total number of trees	Percent of stand killed
Thompson Lakes	91,400	.01	.01	1,828	.36
Lower Thompson River	48,600	.02	.00	972	.15
Pine Prairie	42,000	.058	.026	3,528	.4
Fisher River	61,000	.0	.04	2,440	.24

Total loss for 1940: 8,768 trees - 7,891,200 B.F.

From the preceding data it will be seen that the loss per acre for 1940 is quite low and does not indicate an alarming condition as far as an increase in the severity of the infestation is concerned. In fact, the following tabulation indicates that there is but little change in the status of the infestation from that shown by the 1935 survey. Furthermore, as there are no indications of recent losses in excess of what prevails at this time, one can properly assume that a so-called normal, or endemic, infestation has prevailed during the period between these two projects.

Comparison of Losses of Ponderosa Pine
by the Western Pine Beetle for the
Years 1935 and 1940

Unit	Infested trees per acre	
	1935	1940
Thompson Lakes	.02	.02
Lower Thompson River	.02	.0
Pine Prairie	.09	.084
Fisher River	.02	.04

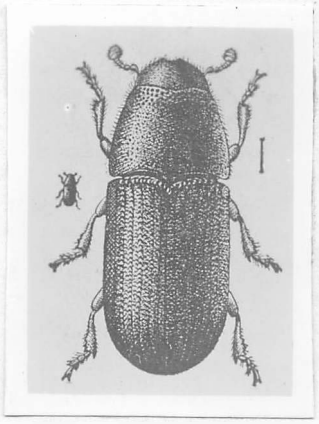
This comparison indicates that for all practical purposes the same level of infestation exists at this time as was present in 1935, as the small difference in the data as shown can properly be charged to inadequate sampling. This would be true of the lower Thompson River, where no infested trees were recorded in 1940, as one can only say that the infestation was not sufficiently severe to be revealed by a survey of the character as conducted. It is interesting to note that the Pine Prairie unit still carries the heaviest loss, which was true throughout the course of the recent epidemic.

Although the present status of the western pine beetle infestation within the ponderosa pine stands of this area can not be considered as alarming, one can not foresee the duration of this condition. The only assurance that can be offered as a means of preventing the occurrence of future destructive outbreaks of this insect rests in detecting the early stages of potentially serious outbreaks. This knowledge will permit the institution of control at a time when maximum results will be obtained from minimum expenditures, and may permit the direction of logging operations into areas susceptible to bark beetle attack.

Respectfully submitted,

JAMES C. EVENDEN
Senior Entomologist

Gallery pattern of Western Pine Beetle. These galleries, along which eggs are deposited, are made by the adult beetles.



Western Pine Beetle

Stand of ponderosa pine killed by Western Pine Beetle.

Western Pine Beetle larvae develop to adult form in outer bark.

THOMPSON RIVER AREA, MONTANA

UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE

WASHINGTON, D.C. Forest Insect Laboratory
Coeur d'Alene, Idaho

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FEB 19 1936
FOREST MANAGEMENT

Refer to file
Project C-4A

Feb. 18, 1936

Regional Forester
Missoula
Montana

Attention of Mr. Koch

Dear Sir:

I have your letter of February 12 commenting upon Mr. Terrell's report on the insect-loss survey of the Thompson River Valley.

I am advised that there are between 2,500,000,000 and 3,000,000,000 bd. ft. of ponderosa pine on this drainage. This loss then would be approximately 3 percent for the 5 years, or an average annual loss of 6/10 of 1 percent. I would judge that your reaction that the average annual loss is being compensated for by the annual increment is perhaps correct. However, if we are going to attempt to produce timber of the same age as that now existing, I believe that the loss would be considerably more than the annual increment. This is something that must be considered in comparing mean annual increment with annual insect losses, for undoubtedly our next crop of timber will be on a much shorter rotation than that which we are now harvesting.

Thanking you for your comments, which we always appreciate, I remain

Yours very truly,

James C. Evenden
Entomologist

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S
~~Disease~~ Control
Insect

February 12, 1936.

James C. Evenden, Entomologist,
Forest Insect Laboratory,
Coeur d'Alene, Idaho.

Dear Mr. Evenden:

I have just read Mr. Terrell's report on insect loss survey of the Thompson River Valley.

This would indicate an average annual loss for the past five years of 62 board feet per annum. My guess would be that this loss is just about offset by growth, so that the stand is not actually diminishing.

Very sincerely yours,

Elers Koch

ELERS KOCH,
Assistant Regional Forester.

M.R.A

copy for Regional Forester
attention of Mr. Koch

& Plant Quarantine

Forest Insect Laboratory
Coeur d'Alene, Idaho
Jan. 17, 1936

Refer to file
Project C-4A

F. S. D-1
RECEIVED
JAN 21 1936
FOREST MANAGEMENT
Ans.

Mr. Frank Tompkins
Chief Timber Inspector
N. P. Land Department
Helena, Montana

Dear Mr. Tompkins:

There is enclosed copy of a brief report by Mr. T.T.Terrell of this laboratory entitled "Insect Loss Survey of the Thompson River Valley and Adjacent Areas". I apologize for our delay in submitting this report, but it seems that so many matters have intervened since the close of our field season that we have not been able to prepare it until this time. I regret this delay and sincerely wish it had not been necessary.

You will note from the tables on page 3 that the acreages for the various units as listed have been shown. These figures have been computed from the accompanying map, and represent the total acreage. Our extensive surveys, which we have found to be very accurate, depict an average condition for the entire acreage covered. Therefore, though the data as given can not be taken as showing conditions on one particular section or group of sections, I am quite sure they will be found to be a very fair average for the unit under consideration. Our sample strips are projected somewhat mechanically and the results tempered with the best judgment of the chief of party, so that a representative sample is secured.

The data have been presented as representing the annual loss for the past five years. I am quite sure that you will recognize the difficulty of determining the year of attack for trees that have been killed for three or four years. However, we have certain rules that have been developed to govern our selection, and feel that our classification is fairly accurate and that, when errors do occur, they will compensate each other.

We were unable to give you a percentage of loss, as we do not have data showing the volume of timber at risk for the different units.

However, we have presented our data both in the number of trees per acre and in computed volume. If you have the volume at risk for any of these units, these data could be used to determine the percentage of loss. From the data given you will note that the loss was greatest in 1931 and 1932. Though the number of attacks per acre were the same for both 1931 and 1933, the total loss was 4,439 MBF more in 1931. This increased loss was due to the difference in the size of the trees attacked. The infestation has decreased since 1932, until in 1935 there was but .04 tree per acre infested.

Though this loss represents a rather large volume of timber, the infestation does not seem to be sufficiently serious to justify the institution of control measures. The total of 93,909 MBF for the 5-year period is indeed a real loss and one which undoubtedly will make a material reduction of the total volume of the area. Though outbreaks of the western pine beetle do not destroy as large a percentage of the stand as those of the mountain pine beetle, they occur at more frequent intervals. From the above data we assume that the cycle of infestation was at its peak in 1932 and that at the present time it has returned to at least a near-normal status. We are unable to say just how long this condition will exist. However, from past experiences one may be rather safe in assuming that it will not be for any great number of years.

It is evident that the loss has been sufficiently serious to justify keeping a rather careful check upon subsequent losses so that, in the event that the infestation again starts to increase to an epidemic status, some action could be taken. I would suggest that at least a biennial survey should be made of this drainage, though of course an annual reconnaissance would be better. At the time the plan for this survey was developed you stated that you would like to have it conducted each year. We should be pleased to have your reaction upon this matter, so that if you desire us to repeat this cooperation during the coming season we may be able to plan for it.

Again I apologize because this report was not completed sooner and trust that the information which we have given you is satisfactory. I assure you that we are desirous of being of any further assistance to you possible. If there are any questions concerning this infestation which we have not mentioned, I shall be glad to advance further information.

Sincerely yours,

James C. Evenden
Entomologist

cc to:
Mr. Parker
Mr. Haines
Dr. Craighead
Forest Supervisor Cabinet
Mr. Miller + Mr. Keen